REMARKS

In the Office Action, dated May 8, 2003, the Examine states that Claims 1-21 are pending, Claims 1-4 and 21 are rejected, Claims 5-19 are objected to, and Claim 20 is allowed. By the present Amendment, Applicant amends the claims and the abstract.

In the Office Action, the specification is objected to for not including an abstract. The present application is a completion of PCT/AU00/00219 which included an abstract. However, the Applicant presents herewith a new abstract.

In the Office Action, Claims 7-15 and 17-19 are objected to under 37 CFR 1.75(c) as being in improper multiple dependent form. The Applicant notes however that a preliminary amendment was filed at the time of filing the application, with Claims 1-25, which were amended to be in proper form. A telephone call to Examiner Wood by Applicant's attorney revealed that said preliminary amendment was received by the U.S. P.T.O., as evidenced by Applicant's stamped return postcard (enclosed with copy of preliminary amendment), but has apparently been lost and not in the record. The Applicant has thus amended the Claims 1-21, which are presumed on file, to remove the improper multiple dependencies. Due to the confusion over what claims are on file, Applicant has included both clean and amended versions of the claims. Applicant requests that if the application is again rejected, that the next Office Action not be made final due to the loss of the preliminary amendment which necessitated the present Office Action.

The Applicant has also added new Claims 22-25, which have been previously paid for when the preliminary amendment was filed. No additional claim fees are thus considered required.

In the Office Action, Claims 1-4 and 21 are rejected under 35 U.S.C. §102(e) as anticipated by Foresi (US 5,841,931). The Applicant respectfully disagrees with and traverses this rejection.

The independent claims in the present application specify that the waveguide layer comprises amorphous silicon. None of the cited prior art references disclose a

silicon based waveguide which is formed by depositing a waveguide layer comprising amorphous silicon on a substrate.

In particular, Foresi teaches the formation of a waveguide layer comprising polycrystalline silicon waveguide layers. A number of ways of forming polycrystalline silicon waveguide layers are disclosed in Foresi, one of which comprises depositing an amorphous silicon precursor layer and annealing the amorphous silicon at 600°C for 16 hours until the amorphous silicon transforms into polycrystalline silicon (see column 5, lines 15-20). Thus, although Foresi teaches using amorphous silicon as a precursor to forming a waveguide layer, there is no disclosure or using amorphous silicon *per se* as a waveguide layer. Foresi does not in any way suggest that amorphous silicon could be used as a waveguide layer.

There are particular advantages to using amorphous silicon waveguide layers rather than polycrystalline silicon waveguide layers. Firstly, the grain boundaries in polycrystalline silicon waveguide layers induce optical scattering which results in increased optical losses. Secondly, amorphous silicon can be deposited at a relatively low temperature without exposing the waveguide to the high annealing temperatures required to form polycrystalline or single-crystal silicon. The ability to form a silicon-containing waveguide layer at relatively low temperatures is important as it allows the waveguide layer to retain physical properties that would be wiped out or weakened at higher temperatures. In particular, the refractive index of a silicon-containing waveguide layer deposited at low temperatures can be modified by charge injection. This effect can be exploited in electro-optic devices such as optical modulators or attenuators. However, the strength of this effect reduces as the processing temperature increases, and is removed entirely at temperatures around 800°C. As noted in Foresi, an annealing temperature of at least 600°C is required in order to convert amorphous silicon to polycrystalline silicon, which would severly reduce the ability to change refractive index in response to charge injection.

Therefore, since Foresi does not recognize the advantages of using amorphous silicon nor disclose amorphous silicon, the present claims are not considered anticipated by Foresi.

With this amendment the Applicant is also submitting an Information Disclosure Statement (IDS) disclosing US 4,695,122 and US 5,515,460.

In light of the foregoing response, all the outstanding objections and rejections have been overcome. Applicant respectfully submits that this application should now be in better condition for allowance and respectfully requests favorable consideration.

Respectfully submitted,

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Date

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